



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/530,629	06/19/2000	MICHAEL DADD	SHP-PT058	1975

7590 12/12/2001

C FREDERICK KOENIG III  
VOLPE AND KOENIG  
1617 JOHN F KENNEDY BOULEVARD  
SUITE 400 ONE PENN CENTER  
PHILADELPHIA, PA 19103

EXAMINER

PEREZ, GUILLERMO

ART UNIT PAPER NUMBER

2834

DATE MAILED: 12/12/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/530,629

Applicant(s)

DADD, MICHAEL

Examiner

Guillermo Perez

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

***Specification***

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6, 9-10, 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kling (U. S. Pat. No. 4,126,797).

Referring to claim 1, Kling discloses an electromechanical transducer (figures 18b and 26) comprising:

a stator (22) having a plurality of coils (a,b,c,d in figures 1 and 2); and  
a magnetic assembly (24,25) having a plurality of magnetic poles (24,25) there being flux linkage between the coils (a,b,c,d) and the magnetic poles (24,25) defining a magnetic circuit for imparting relative linear movement between the stator (22) and the magnetic assembly (24-25 and column 20, lines 30-33), wherein the stator (22) and the magnetic assembly (24,25) are arranged for relative linear movement such that relative

rotational movement is constrained (24-25 and column 17, line 67 through column 18, line 8) and at least one of the plurality of coils (a,b,c,d) and the plurality of magnetic poles (24,25) are arranged to describe a helical path (figure 26) about the axis of the transducer whereby the magnetic circuit (a,b,c,d,24,25) includes a helical component (a,b,c,d in figure 26).

Referring to claim 2, Kling discloses that the stator includes a plurality of core elements (h in figure 23) on which the plurality of coils (17 in figure 23) are mounted and associated pole pieces.

Referring to claim 3, Kling discloses a magnetic circuit member (14,15 in figure 24) provided on the side of the magnetic assembly (13) opposite to the side of the magnetic assembly facing the stator (16).

Referring to claim 4, Kling discloses that the magnetic circuit member (14,15) is integral with the rotor (13) and moves as part of the rotor (13).

Referring to claim 5, Kling discloses that the plurality of coils (a,b,c,d) of the stator (22) and the plurality of magnetic poles (24,25) of the magnetic assembly (24,25) are arranged to describe helical paths about the axis of the transducer (column 13, lines 41-53).

Referring to claim 6, Kling discloses that the angle of the helical path of the plurality of coils is different to the angle of the helical path of the plurality of magnetic poles of the magnetic assembly (column 13, lines 41-53).

Referring to claim 9, Kling discloses that two transducers of opposite handedness are coupled thereby constraining rotational movement of the magnetic assemblies relative to the stator (figure 20 and column 13, lines 8-23).

Referring to claim 10, Kling discloses that at least one of the plurality of core elements and the associated pole pieces of the stator, the magnetic circuit member, and intervening segments interposed between the magnetic poles of the rotor consists of high permeability material (column 14, lines 9-11).

Referring to claim 15, Kling discloses that the rotor does not form a closed cylinder.

Referring to claim 16, Kling discloses a compressor having an electromechanical transducer as claimed in claim 1, connected to a piston and cylinder arrangement (column 20, lines 30-50).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kling in view of Davey et al. (EP 0028144A1).

Kling discloses an electromechanical transducer as described on item 1 above. However, Kling does not disclose that holding means are additionally provided to constrain at least rotational relative movement between the magnetic assembly and the

stator. Kling does not disclose that the holding means is in the form of one or more spiral springs.

Davey et al. disclose that holding means (31) are additionally provided to constrain at least rotational relative movement between the magnetic assembly (16) and the stator (13). Davey et al. disclose that the holding means (31) is in the form of one or more spiral springs (31). The invention of Davey et al. has the purpose of creating axial flexibility and distributing stresses equally.

It would have been obvious at the time the invention was made to modify the electromechanical transducer of Kling and provide it with the holding means disclosed by Davey et al. for the purpose of creating axial flexibility and distributing stresses equally.

3. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kling in view of Prymak (U. S. Pat. No. 4,616,151).

Kling discloses an electromechanical transducer as described on item 1 above. However, Kling does not disclose that at least one of the stator, the magnetic assembly and the magnetic circuit member consists of a plurality of laminations stacked together. Kling does not disclose that the planes of the individual laminations describe a helical path about the axis of the transducer.

Prymak discloses that at least one of the stator (figure 1), the magnetic assembly and the magnetic circuit member consists of a plurality of laminations (9) stacked together. Prymak discloses that the planes of the individual laminations (9) describe a helical path about the axis of the transducer. Prymak's invention has the

purpose of reducing the excitation of resonant case vibration modes and producing quieter motor operation.

It would have been obvious at the time the invention was made to modify the electromechanical transducer of Kling and provide it with the stator configuration disclosed by Prymak for the purpose of reducing the excitation of resonant case vibration modes and producing quieter motor operation.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kling in view of Cook et al. (U. S. Pat. No. 5,719,451).

Kling discloses an electromechanical transducer as described on item 1 above. However, Kling does not disclose that the magnetic assembly consists of a single component having isotropic magnetization characteristics whereby the magnetic assembly has a non-binary magnetic field distribution.

Cook et al. disclose that the magnetic assembly (25) consists of a single component having isotropic magnetization characteristics whereby the magnetic assembly (25) has a non-binary magnetic field distribution (column 5, lines 12-22). Cook et al. has the purpose of providing opposed magnetic poles at portions of the cylindrical faces at opposite ends of the cylinder.

It would have been obvious at the time the invention was made to modify the electromechanical transducer of Kling and provide it with the isotropic magnetization characteristics disclosed by Cook et al. for the purpose of providing opposed magnetic poles at portions of the cylindrical faces at opposite ends of the cylinder.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kling in view of Delson et al. (U. S. Pat. No. 6,002,184).

Kling discloses an electromechanical transducer as described on item 1 above. However, Kling does not disclose a torque transducer for measuring the axial force generated by the electromechanical transducer.

Delson et al. disclose a torque transducer (129) for the purpose of measuring the axial force generated by the electromechanical transducer.

It would have been obvious at the time the invention was made to modify the electromechanical transducer of Kling and provide it with a torque transducer as disclosed by Delson et al. for the purpose of measuring the axial force generated by the electromechanical transducer.

### ***Response to Arguments***

The Examiner reviewed the amendment mailed on August 13, 2001, the Final Rejection mailed on August 14, 2001, and the Interview Summary mailed on September 21, 2001 and considers that the reference to Kling still shows the claimed limitations as stated above. The magnetic poles of Kling in figure 26 are helical since the stator (22) is the cylindrical formation or closing of the magnetic pole support shown in figure 18b, according to the description in the text (column 20, lines 47-50). By closing the magnetic pole support in figure 18b, the magnetic poles of the stator (22) end up forming a helical path.

The amendments mailed on August 13, 2001 changed the scope of the claims such in such a way that the rejections under 35 USC § 112 are no longer applicable.



The Action has been reviewed to point out specific passages and figures of the references to show the Examiner's position.

In response to Applicant's argument that Kling does not disclose a magnetic circuit including a helical component, it must be noted that figures 1-2 and 26 of Kling shows that the coils form a helical component. The embodiment of figure 26 is arranged for relative linear movement, a piston embodiment is being shown which shows the linearity of the embodiment movement. Figures 1 and 2 show that the sole movement occurring in the rotor is a linear movement since the stator poles are being switched from polarities to attracting the magnet strip in a linear path. Claim 1 requires the magnetic circuit to include a helical component, the coils are the helical components in figure 26. Claim 1 does not require a rotational constraint in the embodiment. The restraint disclosed in Davey et al. is applicable to the embodiment of figure 26 of Kliman since it is needed to prevent the piston from rotating.

In response to Applicant's argument that the laminations are skewed and not helical it must be noted in Figure 3 that Prymak shows a portion of a helical pattern of the stacked laminations. The helical structure shown by Prymak shows the limitations as claimed.

The torque transducer of Delson et al. can be used to determine axial force of the axial transducer by knowing the angular torque (with the torque transducer) and distance from the angular torque center to the point where the axial torque is applied.

**Conclusion**

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Perez whose telephone number is (703) 306-5443. The examiner can normally be reached on Monday through Thursday and alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308 1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3432 for regular communications and (703) 305 3432 for After Final communications.

Application/Control Number: 09/530,629  
Art Unit: 2834

Page 10

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Guillermo Perez  
December 6, 2001

  
NESTOR RAMIREZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800